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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/445,423	12/10/99	HATA	K 2839-0072-0

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EXAMINER

FERGUSON, L

ART UNIT	PAPER NUMBER
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1774

DATE MAILED:

05/09/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/445,423

Applicant(s)

HATA ET AL.

Examiner

Lawrence Ferguson

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 1999.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 9 and 10 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

DETAILED ACTION

Withdrawal of Restriction

1. Applicants election with traverse of Group II (claims 5-8) in Paper No. 4 is acknowledged. Upon further consideration, the restriction requirement of 3/23/01 (Paper No. 4) is WITHDRAWN.
2. The abstract of the disclosure is objected to because the term *detects* in line 3 of the abstract, should be written as defects. Correction is required. See MPEP § 608.01(b).
3. Claim 4 objected to because of the following informalities: The term detect should be written as defect. Appropriate correction is required.
4. Claims 9 and 10 objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n).

Claim Rejections – 35 USC 103(a)

9. Claims 1, 3, 5-7 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osaka et al. (U.S. 5,057,360).

10. Applicant claims a ceramic sheet having not more than 5 defects.

11. Osaka discloses a ceramic composition comprising 100 parts by weight of at least one fine ceramic powder selected from the group consisting of zirconia having an average particle diameter in the range of 0.01 to 2 microns (abstract, lines 1-5). Osaka discloses the green sheet having the possibility of sustaining a fracture or crack (column 1, lines 26-27). Osaka discloses solid electrolyte fuel cells (column 3, lines 23-24). Osaka discloses at least one species of fine ceramic powder consisting of zirconia having an average particle diameter in the range of 0.01 to 2 microns and the individual particles of the ceramic powder as the raw material have a homaxially spherical shape (column 3, lines 37-51). The zirconia powder is mixed with yttrium (column 3, lines 60-64). Osaka discloses minute spherical zirconia having particle diameter whose standard deviation is in the range of 1 to 1.5 (column 5, lines 17-20). Osaka discloses a fixed gap and subsequently heating and drying continuously at a fixed temperature range of 40°C to 150°C to produce the ceramic green sheet (column 7, lines 62-65). The ceramic sheet is obtained by calcining the green sheet at a temperature in the range of 200°C to 500°C (column 8, lines 26-36). By heating at the specified temperature the green sheet is sandwiched and baked within the ceramic material. This can be considered a sintering temperature because it heated the material without melting the material. Osaka discloses very small spherical particles of zirconia having an average diameter of 0.5 micron (column 9, lines 61-62). Osaka discloses an amount of

warp in the range of 0.007mm to 0.023mm (column 14, lines 5-15). A warp is analogous to a flaw. Osaka does not disclose the defects being detected based on an image obtained with a charge coupled device. An image obtained with a charged coupled device is an experimental procedure and is not considered to be part to the claimed product, which is a ceramic sheet. Although Osaka does not specifically mention that the sheet has fewer than 5 defects, only the crack and warp is mentioned. Therefore it would have been obvious to one of ordinary skill in the art to make the ceramic green sheet as claimed because Osaka teaches only 2 defects.

Claim Rejections – 35 USC 103(a)

12. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuo et al. (JP 8151270).

13. Applicant claims a ceramic sheet having not more than 5 defects.

14. Kazuo discloses an average particle size of .1-0.5 μ m (abstract, line 6). Kazuo discloses a firing temperature placed on the green sheet and firing to give the ceramic sheet more than 400cm area, less than 0.4mm thickness and less than 0.1% warpage (abstract, lines 7-11). The firing of the sheets is considered to be baking at a sintered temperature because no melting of parts is observed. Figures 1-3 depict a sandwiching of the various parts of the invention. Kazuo discloses a ceramic sheet with 10% cracks or less (column 1, lines 1-19). Kazuo discloses a ceramic sheet composed of zirconia (column 1, lines 20-21) and yttria (column 1, lines 22-25). Kazuo discloses using the ceramic sheet for an electrolyte film for a battery (column 1, lines 26-27). Kazuo discloses the average diameter of the original material is 0.1-0.5 μ m (column 1, lines

30-33). Kazuo discloses a ceramic sheet with a centered ceramic green sheet and centered porous sheet having a density of 30-85% (column 1, lines 36-49). Kazuo does not disclose the defects being detected are less than five^{and} based on an image obtained with a charge coupled device. No more than 1 defect is mentioned. An image obtained with a charged coupled device is an experimental procedure and is not considered to be part to the claimed product, which is a ceramic sheet. Kazuo does not disclose spherical particles. It would have been obvious to one of ordinary skill to a design choice to make the particles spherical, since such a modification would have involved a mere change in shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art.

Claim Rejections – 35 USC 103(a)

15. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuo et al. (JP 8151271).

16. Applicant claims a ceramic sheet having not more than 5 defects.

17. Kazuo discloses a ceramic sheet obtained by placing the green sheet on or between porous sheets (abstract, lines 4-8) and firing the green sheet to the ceramic sheet (abstract, lines 9-11). The firing of the sheets is considered to be baking at a sintered temperature because no melting of parts is observed. Figures 1-3 depict a sandwiching of the various parts of the invention. Kazuo discloses a ceramic sheet having an area of more than 600 cm² and thickness of 1mm or less (column 1, lines 1-4). Kazuo discloses a maximum warping of 100µm or less and 0.1% or less warpage (column 1, lines (5-7). Kazuo discloses the main component consisting of zirconia and a second composition consisting of yttria (column 1, lines 8-11). Kazuo discloses a

particle size of 0.1-0.5 μ m and a particle size of 1 μ m or less (column 1, lines 19-25). Kazuo does not disclose spherical particles. It would have been obvious to one have been an obvious matter of design choice to make the particles spherical, since such a modification would have involved a mere change in shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. Kazuo discloses use for electrolyte film (column 1, lines 30-32). Kazuo discloses a ceramic sheet with a centered ceramic green sheet and centered porous sheet having a density of 30-85% (column 1, lines 36-49). Kazuo does not disclose the defects being detected based on an image obtained with a charge coupled device. An image obtained with a charged coupled device is an experimental procedure and is not considered to be part to the claimed product, which is a ceramic sheet. Kazuo does not disclose a sintering temperature. It would have been obvious to one of ordinary skill in the art to include sintering temperature range applicant is claiming because discovering the optimum or workable ranges involves only routine skill in the art.

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Ferguson whose telephone number is (703) 305-9978. The examiner can normally be reached on Monday through Friday 8:30 AM – 4:30PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on (703) 308-0449. Please allow the examiner twenty-four hours to return your call.

Art Unit: 1774

The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-5408 for regular communications and (703) 305-3599 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2351.

A stylized handwritten signature consisting of the letters 'L', 'D', and 'F' connected together.

Lawrence D. Ferguson
Examiner
May 1, 2001

CYNTHIA H. KELLY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

A handwritten signature in cursive script, appearing to read 'Cynthia H. Kelly'.